STATEWIDE RAILYARD AGREEMENT

Second Public Meeting

July 13, 2006

Locomotive Research and Demonstration Projects

Advanced Locomotive Emission Control System Demonstration at Roseville Rail Yard

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Placer County Air Pollution Control District

Presentation Outline

- **Short chronology of events that led to the Advanced Locomotive Emission Control System (ALECS) demonstration project …*aka the "hood"***
  - **How the ALECS came into being**
  - **On-going mitigation efforts**
- **ALECS demonstration project overview**
  - **What is it?**
  - **Overall project objectives**
  - **Project team members and schedule**

PCAPCD Project Manager Mr. Don Duffy and ACTI Vice President Mr. Sal Caro are available to answer any detailed technical questions after this presentation.

Why A Study of the Rail Yard?

- Rail yard expansion in 1996
- Citizens complaints regarding odors
- Citizens concerns regarding Toxic Air Contaminants (TACs)
- District concerns about diesel PM and its impact on public health
- District unable to resolve complaints
- District asked ARB to conduct a risk assessment of the rail yard in March 2000

Results of ARB Study of Roseville Rail Yard

- **Year 2000 diesel PM emissions: 25 tons**
  - Moving locomotives account for about 50% of emissions, idling locomotives about 45% and testing accounts for about 5%

Note that rail traffic has increased in the period since the baseline 1999-2000 timeframe and the rail industry is a major factor in statewide and nationwide Goods Movement actions (marine vessels, trains,trucks)

- **Large region impacted by the diesel PM emissions from the Yard**
  - Potential cancer risks greater than 500 in a million occur northwest of the Service Track area and Hump and Trim (10-40 acres)
  - Potential cancer risks greater than 100 in a million occur over 700-1600 acres
  - Potential cancer risk greater than 10 in a million occur over 46,000-56,000 acres impacting between 140,000 and 155,000 people
- **Results presented to the District Board and the public in October, 2004**

District Specific Objectives

For the Railroad Study

- Provide an accurate assessment
- Make full disclosure to the public
- Present a factual presentation to the public of the risks in context of other emissions sources
- Identify mitigation measures
- Develop & implement risk reduction plan
- Develop an air monitoring plan

UPRR/Placer Air District Agreement

Release of the Study Led to an Agreement to Reduce Emissions at the Railyard and Contained Three Elements….

- **Air Monitoring Project**
- **Grant Program**
- **Mitigation Plan**
  - **-Unnecessary idling reductions**
  - **-Use of low-sulfur diesel fuel for intrastate switchers and locomotives**
  - **-Hump and trim switcher fleet replacement/upgrades**
  - **-Emission control from service, test & repair areas (aka the "hood")**

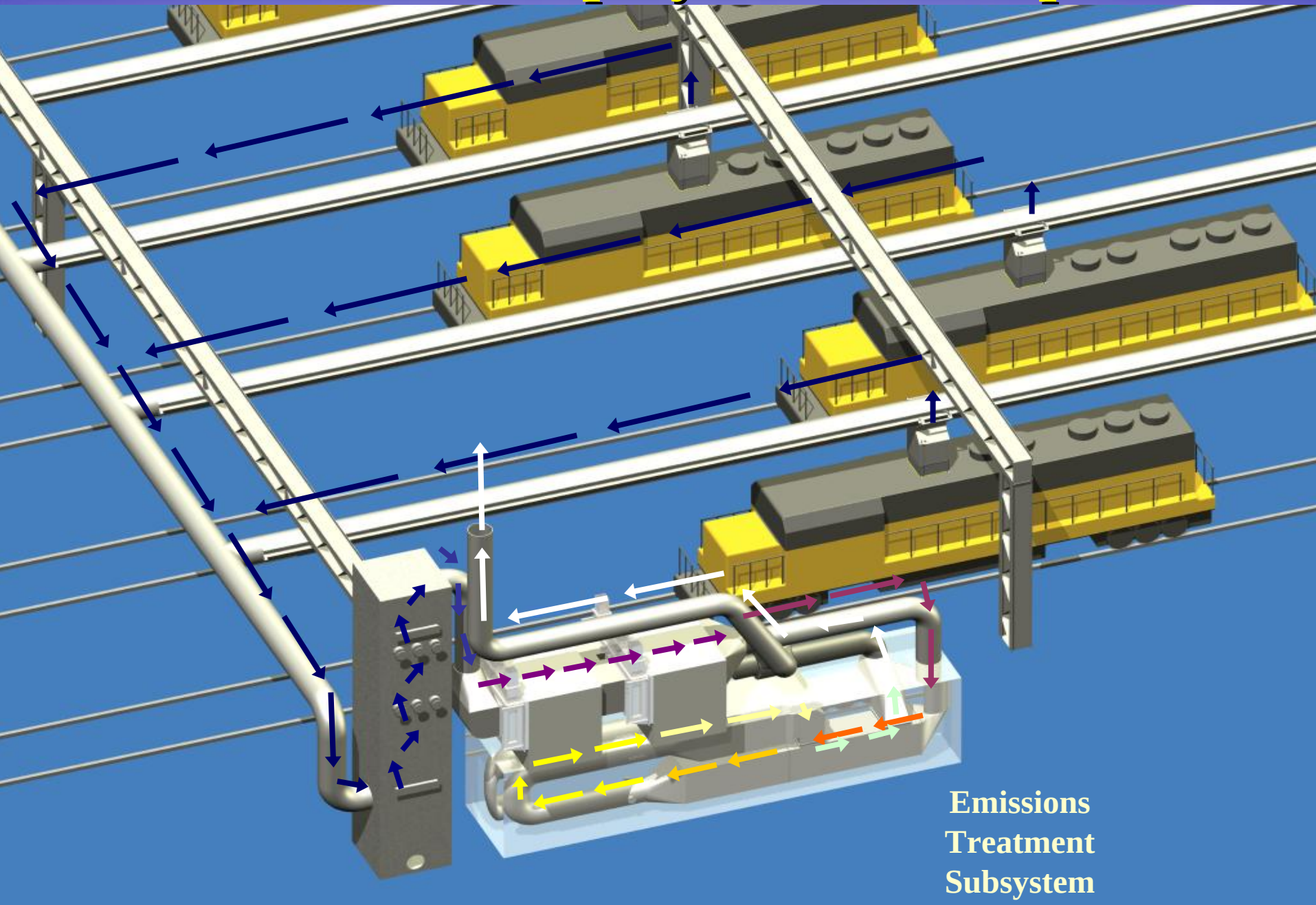
The first two mitigation measures will effect reductions from the entire facility, which are also a component of the Statewide Agreement, while the last two target the areas of the facility that produce DPM concentrations to reduce risk "peaks"

What is the ALECS?

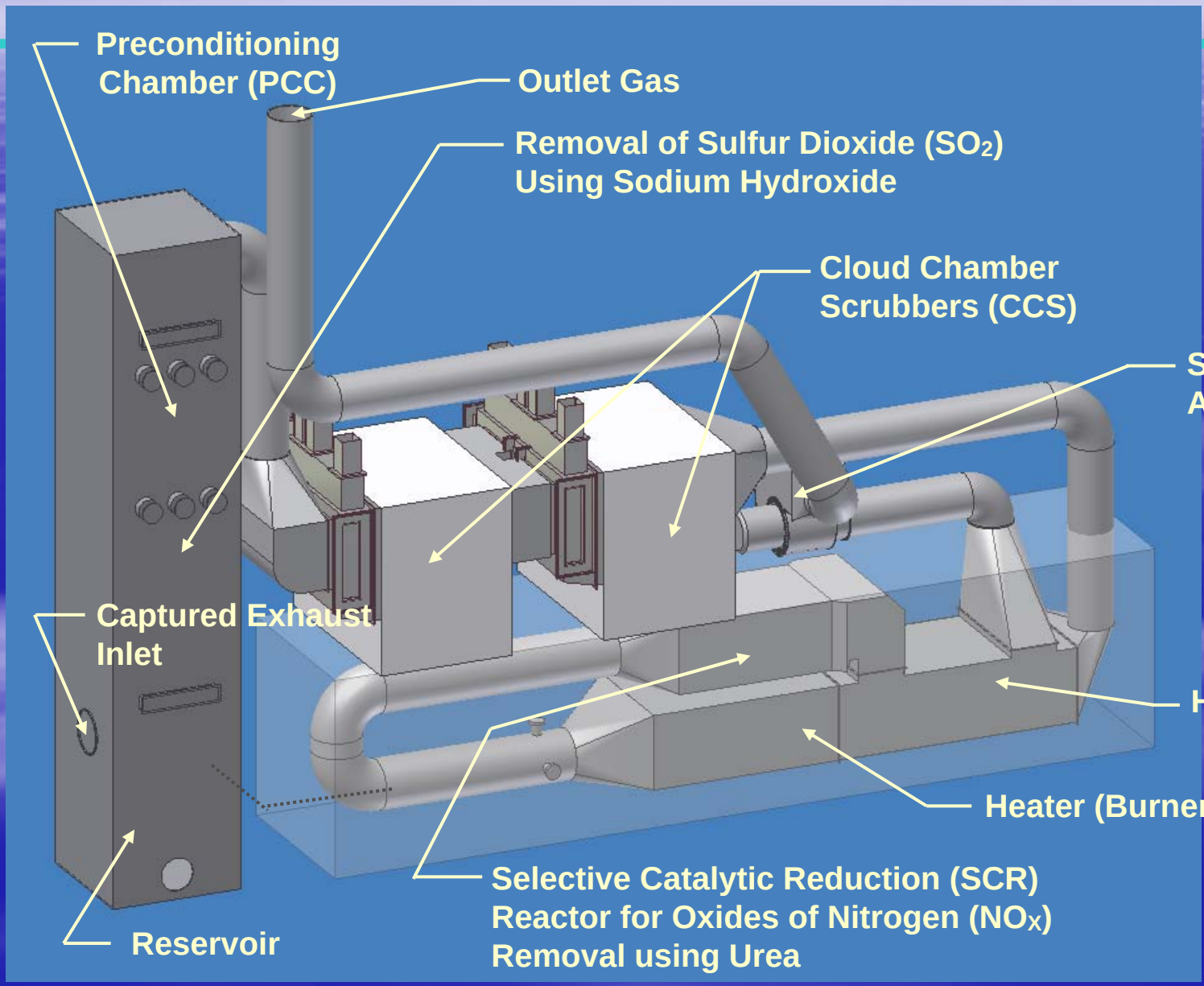
- Utilization of Stationary air pollution control equipment to capture and treat emissions from stationary or slow-moving locomotives in the rail yard while idling or undergoing engine diagnostics or load tests
- Reduces emissions:
  - Sulfur dioxide (SO_2) by 99%
  - Particulate Matter (PM) by 99%
  - Oxides of nitrogen (NO_x) by 95%
  - Water-soluble volatile organic compounds (VOCs) by 50%
  - Ammonia slip of 5 ppm or less

ACTI is the developer of this system and was initially targeting the system for maritime applications. The emissions treatment unit of the system is identical for both rail and maritime applications

Rail Yard Deployment Concept

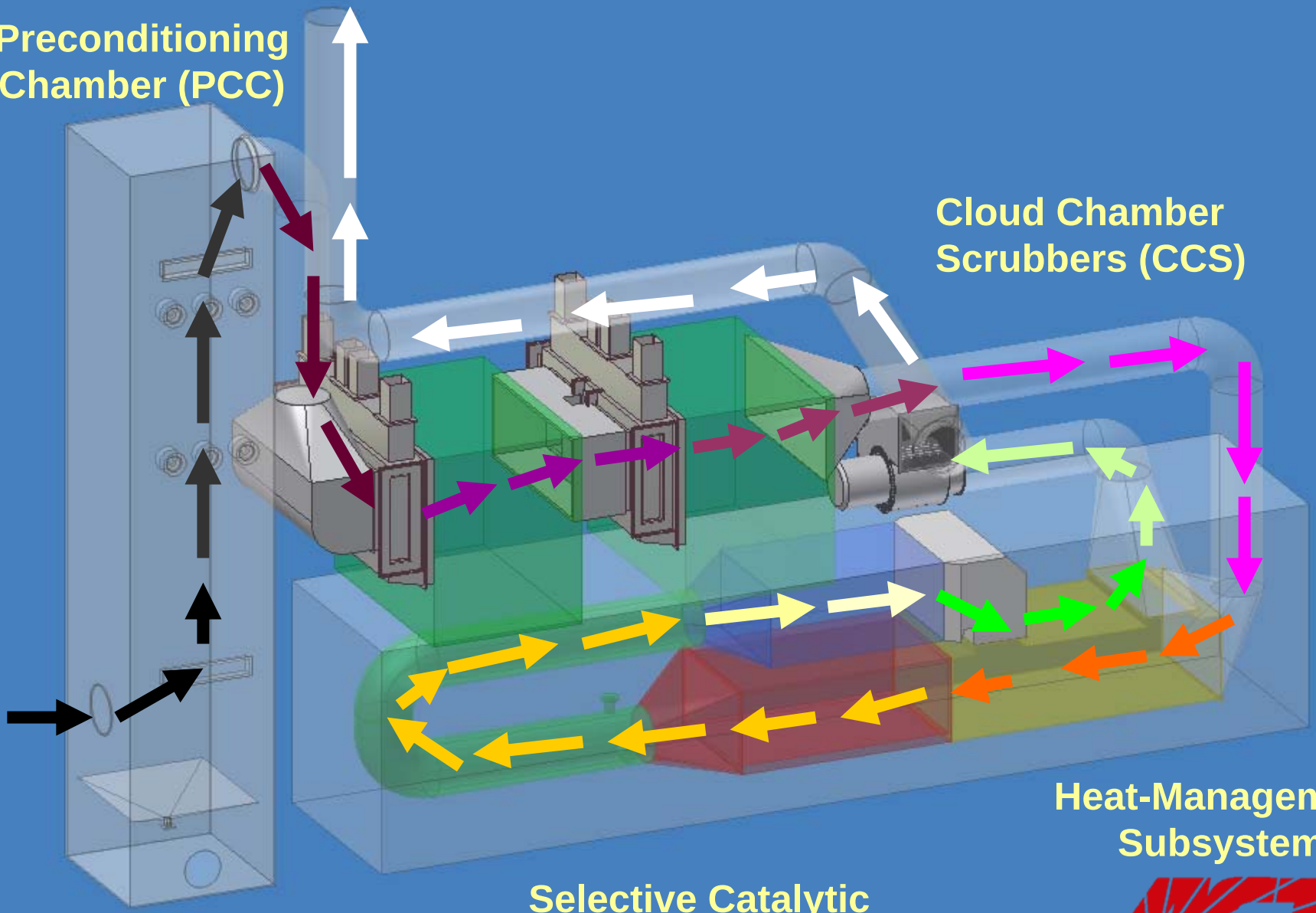


Emissions Treatment System



ETS Major Components

Emissions Treatment Subsystem Captured Exhaust Flow



ALECS Project Objectives

Project initiated with a grant from West Coast Diesel Collaborative for a short-term test of an abbreviated system.

Objective 1: Demonstrate the effectiveness of stationary control equipment on locomotive exhaust (Test for NOx, PM, SOx, and VOC using two locomotive types on CARB and EPA diesel)

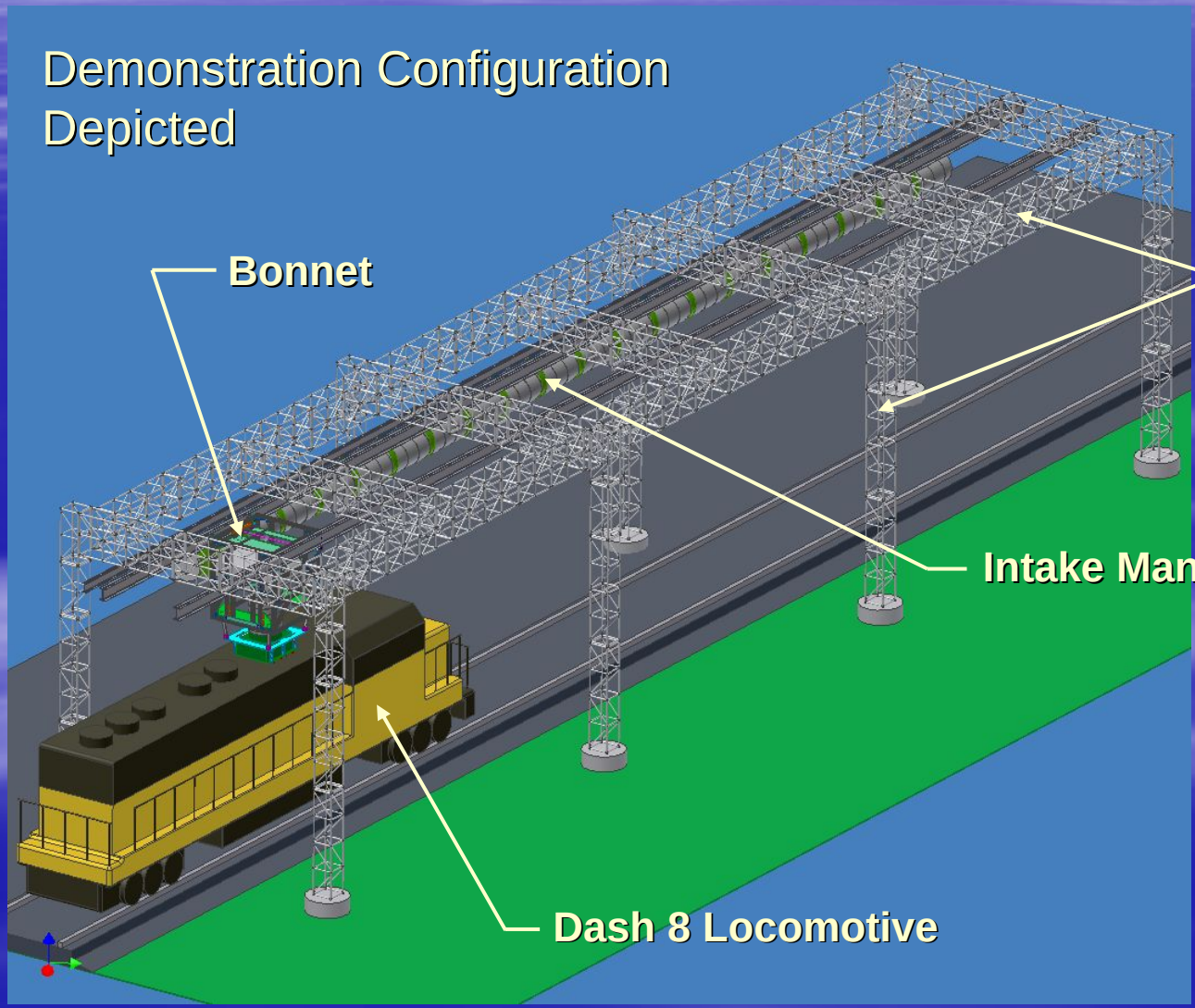
Objective 2: Demonstrate the attachment scheme between the locomotive and the stationary control equipment (Switcher and line-haul)

Objective 3: Demonstrate the capability of some locomotive movement while connected to the control equipment (Switcher and line-haul)

Objective 4: Develop improved information on capital cost, operating procedures, and operating costs.

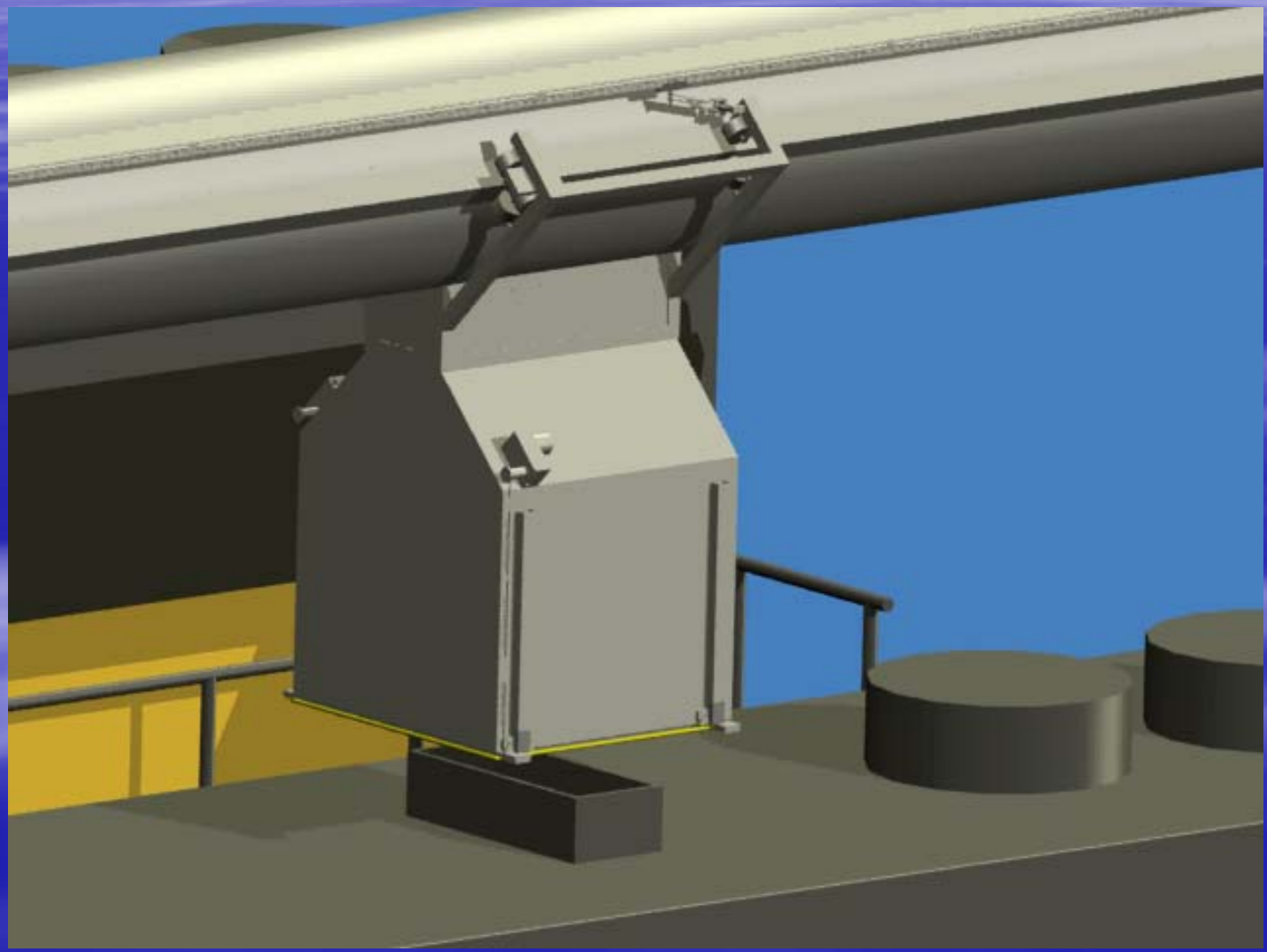
Objective 5 Document test results and project findings in a final report

Demonstration Configuration



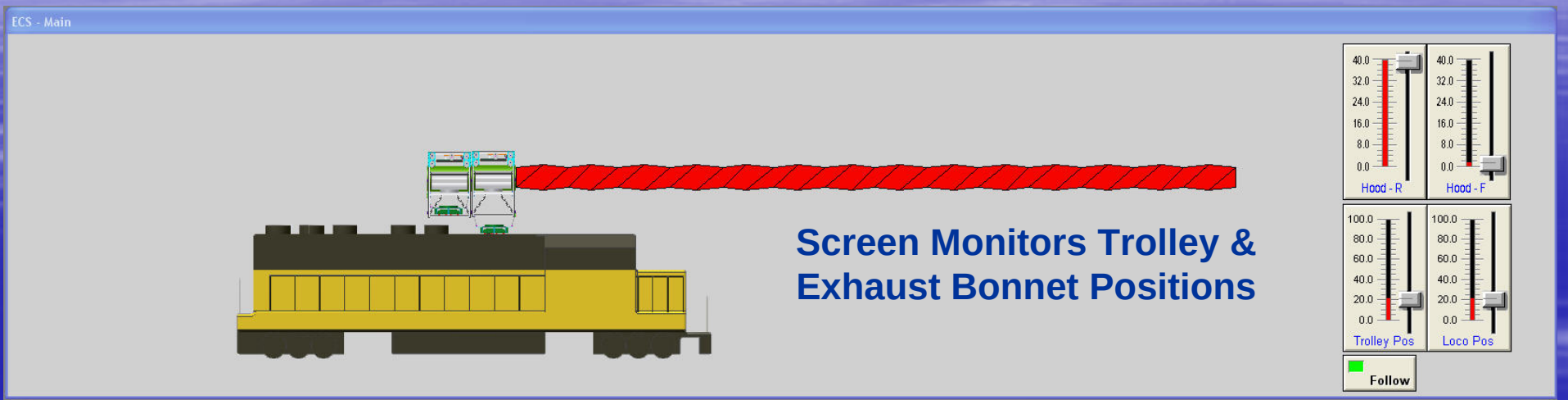
ALECS Emissions Capture System

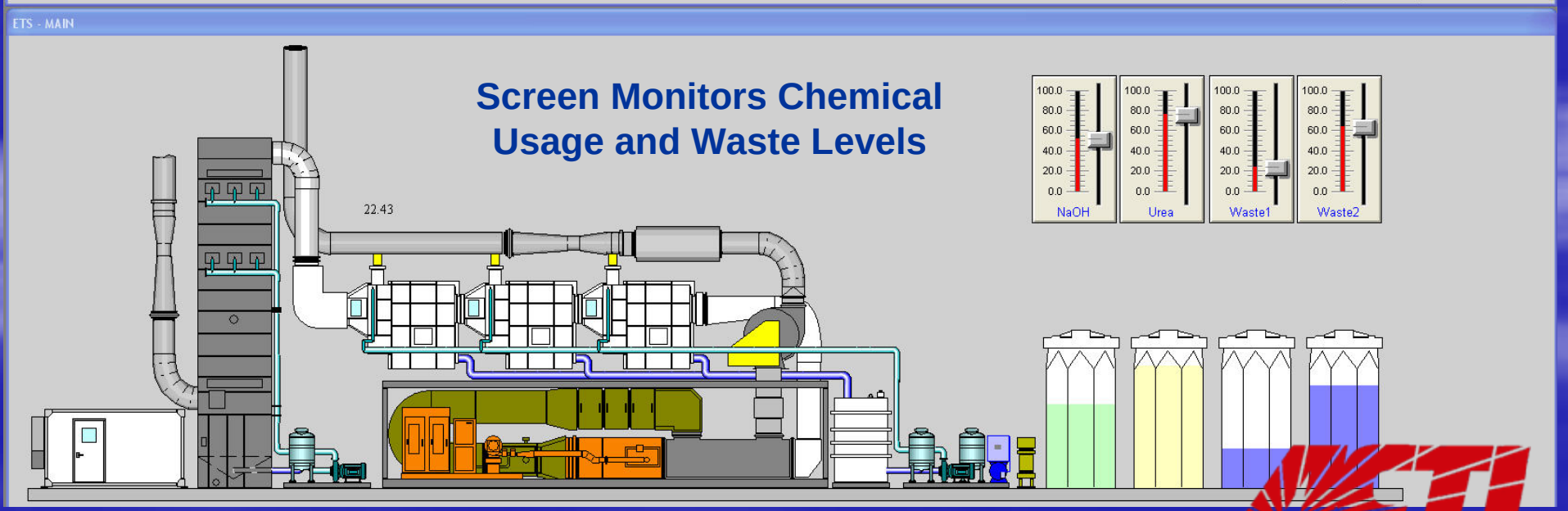
Exhaust Capture Bonnet



Exhaust Capture Bonnet Deployment Depiction

Example ALECS Control Screen





ALECS Sizing

- Demonstration system sized for the maritime application at 12,000 scfm
- Demonstration system can treat one line-haul locomotive at full power, or six locomotives at idle
- ALECS can be upsized to as much as 40,000 scfm capacity
- Details of specific rail yards will dictate size and locations of systems for optimum emissions reductions

Potential Applicability in Rail Yards

- Locations where repetitive operations involve multiple operating locomotives
  - -Fueling and service stations
  - -Diagnostics and maintenance locations
  - -Load testing
  - -Sanding stations
  - -Ready tracks

Demonstration Test Construction

(as of mid-June, 2006)

Construction Progress

ALECS Project Team

MEMBER	CONTRIBUTION	TYPE
Placer County APCD -TIAX -Ogilvy PR	$50,000	Dollars & Staff Hours
Sacramento AQMD	$25,000	Dollars
Union Pacific Railroad	$200,000+	Staff Hours Locomotives Test Site + Utilities
Advanced Cleanup Tech -Tri-Mer	$1,000,000+	Interface Design Loan of ALECS Operation

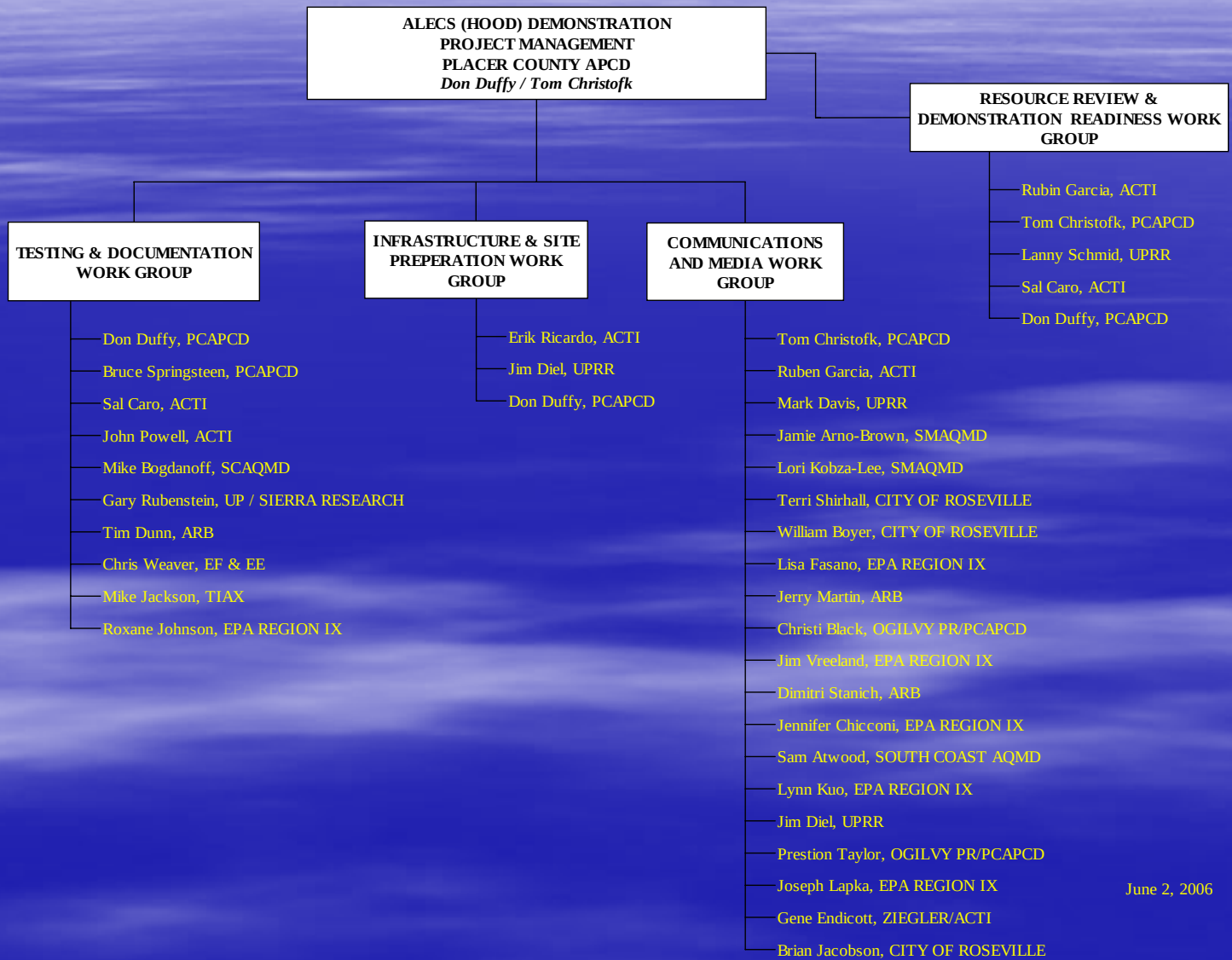
ALECS Project Team

Continued…

MEMBER	CONTRIBUTION	TYPE
CA Air Resourced Board	Technical Review	Staff Resources
South Coast AQMD	$50,000	Dollars
US EPA Region 9	$39,000	Dollars
City of Roseville	$10,000	Media & PR / Dollars

ALECS Working Group Structure

Advanced Locomotive Emissions Control System Demonstration Project Management Working Group

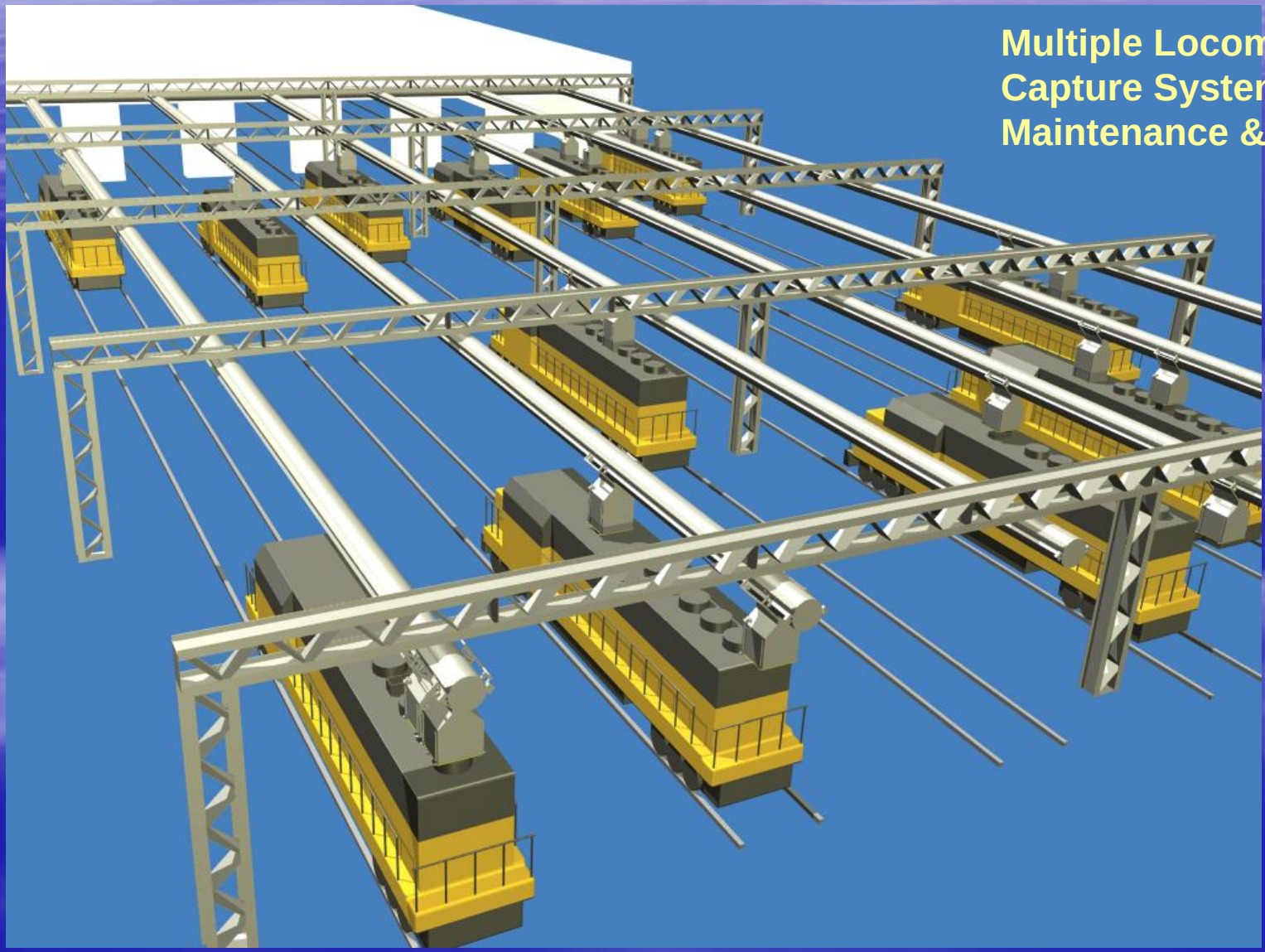


June 2, 2006

ALECS Schedule Milestones

➢Project Start	September 2005
➢ALECS Installation and Startup	Ongoing
➢Start Demonstration Testing	July 31, 2006
➢Media Event & Demonstration	August 2, 2006
➢Complete Demonstration Testing	August 11, 2006
➢Final Report	November, 2006

Implementation Concept



Multiple Locomotive Exhaust Capture System – Railroad Maintenance & Service Facility